CHAPTER 7

MINERAL METABOLISM

1. When ATP forms AMP

(A) Inorganic pyrophosphate is produced
(B) Inorganic phosphorous is produced
(C) Phsophagen is produced
(D) No energy is produced

2. Standard free energy (ΔG°) of hydrolysis of ATP to ADP + Pi is

(A) –49.3 KJ/mol (B) –4.93 KJ/mol
(C) –30.5 KJ/mol (D) –20.9 KJ/mol

3. Standard free energy (ΔG°) of hydrolysis of ADP to AMP + Pi is

(A) –43.3 KJ/mol (B) –30.5 KJ/mol
(C) –27.6 KJ/mol (D) –15.9 KJ/mol

4. Standard free energy (ΔG°) of hydrolysis of phosphoenolpyruvate is

(A) –61.9 KJ/mol (B) –43.1 KJ/mol
(C) –14.2 KJ/mol (D) –9.2 KJ/mol

5. Standard free energy (ΔG°) of hydrolysis of creatine phosphate is

(A) –51.4 KJ/mol (B) –43.1 KJ/mol
(C) –30.5 KJ/mol (D) –15.9 KJ/mol

6. The oxidation-reduction system having the highest redox potential is

(A) Ubiquinone ox/red
(B) Fe^{3+} cytochrome a/Fe^{2+}
(C) Fe^{3+} cytochrome b/Fe^{2+}
(D) NAD^+/NADH

7. If ΔG°= –2.3RT log Keq, the free energy for the reaction will be

A + B ⇌ C
10 moles 10 moles 10 moles

(A) –4.6 RT (B) –2.3 RT
(C) +2.3 RT (D) +4.6 RT

8. Redox potential (E_o volts) of NAD^+/NADH is

(A) –0.67 (B) –0.32
(C) –0.12 (D) +0.03

9. Redox potential (E_o volts) of ubiquinone, ox/red system is

(A) +0.03 (B) +0.08
(C) +0.10 (D) +0.29

10. Redox potential (E_o volts) of cytochrome C, Fe^{3+}/Fe^{2+} is

(A) –0.29 (B) –0.27
(C) –0.08 (D) +0.22

11. The prosthetic group of aerobic dehydrogenases is

(A) NAD (B) NADP
(C) FAD (D) Pantothenic acid

12. Alcohol dehydrogenase from liver contains

(A) Sodium (B) Copper
(C) Zinc (D) Magnesium

13. A molybdenum containing oxidase is

(A) Cytochrome oxidase
(B) Xanthine oxidase
(C) Glucose oxidase
(D) L-Amino acid oxidase

14. A copper containing oxidase is

(A) Cytochrome oxidase
(B) Flavin mononucleotide
(C) Flavin adenine dinucleotide
(D) Xanthine oxidase

15. The mitochondrial superoxide dismutase contains

(A) Mg^{++} (B) Mn^{++}
(C) Co^{++} (D) Zn^{++}

16. Cytosolic superoxide dismutase contains

(A) Cu^{2+} and Zn^{2+} (B) Mn^{2+}
(C) Mn^{2+} and Zn^{2+} (D) Cu^{2+} and Fe^{2+}

17. Cytochrome oxidase contains

(A) Cu^{2+} and Zn^{2+} (B) Cu^{2+} and Fe^{2+}
(C) Cu^{2+} and Mn^{2+} (D) Cu^{2+}

18. Characteristic absorption bands exhibited by ferrocytochrome:

(A) α band (B) β band
(C) α and β bands (D) α, β and γ bands

19. Monooxygenases are found in

(A) Cytosol (B) Nucleus
(C) Mitochondira (D) Microsomes

20. A component of the respiratory chain in mitochondria is

(A) Coenzyme Q
(B) Coenzyme A
(C) Acetyl coenzyme
(D) Coenzyme containing thiamin

21. The redox carriers are grouped into respiratory chain complex

(A) In the inner mitochondrial membrane
(B) In mitochondiral matrix
(C) On the outer mitochondrial membrane
(D) On the inner surface of outer mitochondrial membrane

22. The sequence of the redox carrier in respiratory chain is

(A) NAD—FMN—Q—cyt b—cyt c_1—cyt c—cyt $aa_3 \longrightarrow O_2$
(B) FMN—Q—NAD—cyt b—cyt aa_3—cyt c_1—cyt c $\longrightarrow O_2$
(C) NAD—FMN—Q—cyt c_1—cyt c—cyt b—cyt $aa_3 \longrightarrow O_2$
(D) NAD—FMN—Q—cyt b—cyt aa_3—cyt c—cyt $c_1 \longrightarrow O_2$

23. The correct sequence of cytochrome carriers in respiratory chain is

(A) Cyt b—cyt c—cyt c_1—cyt aa_3
(B) Cyt aa_3— cyt b—cyt c—cyt c_1
(C) Cyt b—cyt c_1—cyt c—cyt aa_3
(D) Cyt b—cyt aa_3—cyt c_1— cyt c

24. Reducing equivalents from pyruvate enter the mitochondrial respiratory chain at

(A) FMN (B) NAD
(C) Coenzyme Q (D) Cyt b

25. Reducing equivalents from succinate enter the mitochondrial respiratory chain at

(A) NAD (B) Coenzyme Q
(C) FAD (D) Cyt c

26. The respiratory chain complexes acting as proton pump are

(A) I, II and III (B) I, II and IV
(C) I, III and IV (D) I and II

27. If the reducing equivalents enter from FAD in the respiratory chain, the phosphate.oxygen ration (P:O) is

(A) 2 (B) 1
(C) 3 (D) 4

28. If the reducing equivalents enter from NAD in the respiratory chain, the phsphate/oxygen (P:O) is

(A) 1 (B) 2
(C) 3 (D) 4

29. One of the site of phsosphorylation in mitochondrial respiratory chain is

(A) Between FMN and coenzyme Q
(B) Between coenzyme Q and cyt b
(C) Between cytochrome b and cytochrome c_1
(D) Between cytochrome c_1 and cytochrome c

30. Rotenone inhibits the respiratory chain at

(A) FMN $\rightarrow$ coenzyme Q
(B) NAD $\rightarrow$ FMN
(C) Coenzyme Q $\rightarrow$ cyt b
(D) Cyt b $\rightarrow$ Cyt c_1

31. Activity of cytochrome oxidase is inhibited by

(A) Sulphite (B) Sulphate
(C) Arsenite (D) Cyanide

32. Transfer of reducing equivalents from succinate dehydrogenase to coenzyme Q is specifically inhibited by

(A) Carboxin (B) Oligomycin
(C) Piericidin A (D) Rotenone

33. Chemiosmotic theory for oxidative phosphorylation has been proposed by

(A) Chance and Williams
(B) Pauling and Corey
(C) S. Waugh
(D) P. Mitchell

34. The number of ATP produced in the oxidation of 1 molecule of NADPH in oxidative phosphorylation is

(A) Zero (B) 2
(C) 3 (D) 4

35. The coupling of oxidation and phosphorylation in intact mitochondria:

(A) Puromycin (B) Oligomycin
(C) Streptomycin (D) Gentamycin

36. An uncoupler of oxidative phosphorylation is

(A) Carboxin (B) Atractyloside
(C) Amobarbital (D) Dinitrocresol

37. The chemical inhibiting oxidative phosphorylation, Adependent on the transport of adenine nucleotides across the inner mitochondrial membrane is

(A) Oligomycin (B) Atractyloside
(C) Dinitrophenol (D) Pentachlorophenol

38. Porphyrins are synthesized in

(A) Cytosol
(B) Mitochondria
(C) Cytosol and mitochondria
(D) Rough endoplasmic reticulum

39. Heme is synthesized from

(A) Succinyl-CoA and glycine
(B) Active acetate and glycine
(C) Active succinate and alanine
(D) Active acetate and alanine

40. In the biosynthesis of the iron protoporphyrin, the product of the condensation between succinyl-CoA and glycine is

(A) α-Amino β-ketoadipic acid
(B) δ-Aminolevulinate
(C) Hydroxymethylbilane
(D) Uroporphyrinogen I

41. Porphyrin synthesis is inhibited in

(A) Mercury poisoning
(B) Lead poisoning
(C) Manganese poisoning
(D) Barium poisoning

42. During synthesis of porphyrins, synthesis of δ-amino levulinic acid occurs in

(A) Mitochondria
(B) Cytosol
(C) Both in mitochondria and cytosol
(D) Ribosomes

43. In the biosynthesis of heme, condensation between succinyl CoA and glycine requires

(A) NAD^+ (B) FAD
(C) $NADH + H^+$ (D) B_6-phosphate

44. In mammalian liver the rate controlling enzyme in porphyrin biosynthesis is

(A) ALA synthase
(B) ALA hydratase
(C) Uroporphyrinogen I synthase
(D) Uroporphyrinogen III cosynthase

45. The condensation of 2 molecules of δ-aminolevulinate dehydratase contains

(A) ALA synthase
(B) ALA hydratase
(C) Uroporphyrinogen synthase I
(D) Uroporphyrinogen synthase III

46. The enzyme δ-aminolevulinate dehydratase contains

(A) Zinc (B) Manganese
(C) Magnesium (D) Calcium

47. A cofactor required for the activity of the enzyme ALA dehydratase is

(A) Cu (B) Mn
(C) Mg (D) Fe

48. The number of molecules of porphobilinogen required for the formation of a tetrapyrrole i.e., a porphyrin is

(A) 1 (B) 2
(C) 3 (D) 4

49. Conversion of the linear tetrapyrrole hydroxymethylbilane to uroporphyrinogen III

(A) Occurs spontaneously
(B) Catalysed by uroporphyrinogen I synthase
(C) Catalysed by uroporphyrinogen III cosynthase
(D) Catalysed by combined action of uroporphyrinogen I synthase and uroporphyrinogen III cosynthase

50. Conversion of uroporphyrinogen III to coprophyrinogen III is catalysed by the enzyme.:

(A) Uroporphyrinogen decarboxylase
(B) Coproporphyrinogen oxidase
(C) Protoporphyrinogen oxidase
(D) Ferrochelatase

51. The synthesis of heme from protophyrin III is catalysed by the enzyme:

(A) ALA synthase (B) Ferroreductase
(C) Ferrooxidase (D) Ferrochelatase

52. Many xenobiotics

(A) Increase hepatic ALA synthase
(B) Decrease hepatic ALA sythase
(C) Increase hepatic ALA dehydrase
(D) Decrease hepatic ALA dehydrase

53. Acute intermittent porphyria (paraoxymal porphyria) is caused due to deficiency of

(A) Uroporphyrinogen I synthase
(B) ALA synthase
(C) Coproporphyrinogen oxidase
(D) Uroporphyrinogen decarboxylase

54. The major symptom of acute intermittent porphyria includes

(A) Abdominal pain
(B) Photosensitivity
(C) No neuropsychiatric signs
(D) Dermatitis

55. The characteristic urinary finding in acute intermittent porphyria is

(A) Increased quantity of uroporphyrin
(B) Increased quantity of coproporphyrin I
(C) Increased quantity of coproporphyrin III
(D) Massive quantities of porphobilinogen

56. The enzyme involved in congenial erythropoietic porphyria is

(A) Uroporphyrinogen I synthase
(B) Uroporphyrinogen III cosynthase
(C) Protoporphyrinogen oxidase
(D) Ferrochelatase

57. Main symptoms of congenital erythropoietic porphyria is

(A) Yellowish teeth (B) Photosensitivity
(C) Abdominal pain (D) Brownish urine

58. The probable cause of porphyria cutanea tarda is deficiency of

(A) Uroporphyrinogen oxidase
(B) Coproporphyrinogen oxidase
(C) Protoporphyrinogen oxidase
(D) Uroporphyrinogen I synthase

59. The characteristic urinary finding in porphyria cutanea tarda is

(A) Increased quantity of porphobilinogen
(B) Increased quantity of red cell protoporphyrin
(C) Increased quantity of uroporphyrin
(D) Increased quantity of δ-ALA

60. Hereditary coproporphyria is caused due to deficiency of

(A) Protoporphyrinogen oxidase
(B) ALA synthase
(C) ALA dehydratase
(D) Coproporphyrinogen oxidase

61. The enzyme involved in variegate porphyria is

(A) Protoporphyrinogen oxidase
(B) Coproporphyrinogen oxidase
(C) Uroporphyrinogen decarboxylase
(D) ALA decarboxylase

62. Protoporphyria (erythrohepatic) is characterized by the deficiency of

(A) ALA synthase
(B) ALA hydratase
(C) Protophyrinogen oxidae
(D) Ferrochelatase

63. The amount of coproporphyrins excreted per day in feces is about

(A) 10–50 µgs (B) 100–150 µgs
(C) 200–250 µgs (D) 300–1000 µgs

64. The immunoglobulins are differentiated and also named on the basis of

(A) Electrophoretic mobility
(B) Heat stability
(C) Molecular weight
(D) Sedimentaiton coefficient like 7 S, 19 S etc.

65. The immunoglobulins are classified on the basis of

(A) Light chains
(B) Heavy chains
(C) Carbohydrate content
(D) Electrophoretic mobility

66. All immunoglobulins contain

(A) 4 L chains
(B) 4 H chains
(C) 3 L chains
(D) 2 L chains and 2 H chains

67. An immunoglobulin molecule always contains

(A) 1 κ and 3 λ type of chains
(B) 2 κ and 2 λ type of chains
(C) 3 κ and 1λ type of chains
(D) 2 κ and 2 λ chains

68 . The number of types of H chains identified in human is

(A) 2 (B) 3
(C) 4 (D) 5

69. The number of hypervariable region in L chain is

(A) 1 (B) 2
(C) 3 (D) 4

70. The number of hypervariable region in H chain is

(A) 1 (B) 2
(C) 3 (D) 4

71. Type γ H chain is present in

(A) Ig G (B) Ig A
(C) Ig M (D) Ig D

72. Type α H chain is present in

(A) Ig E (B) Ig A
(C) Ig M (D) Ig D

73. Type µ H chain is present in

(A) Ig G (B) Ig A
(C) Ig M (D) Ig D

74. Type δ H chain is present in

(A) Ig G (B) Ig A
(C) Ig M (D) Ig D

75. Type ε H chain is present in

(A) Ig A (B) Ig M
(C) Ig D (D) Ig E

76. A 'J' chain is present in

(A) Ig D (B) Ig M
(C) Ig G (D) Ig E

77. A secretory protein T chain (T protein) is present in

(A) Ig A (B) Ig M
(C) Ig D (D) Ig E

78. A pentamer immunoglobulin is

(A) Ig G (B) Ig A
(C) Ig M (D) Ig E

79. The portion of the immunoglobulin molecule that binds the specific antigen is formed by

(A) Variable regions of H and L chains
(B) Constant region of H chain
(C) Constant region of L chain
(D) Hinge region

80. The class specific function of the different immunoglobulin molecules is constituted by

(A) Variable region of L chain
(B) Constant region of H chain
(C) Variable region of H chain
(D) Constant region particularly C_H2 and C_H3 of H chain

81. Hinge region, the region of Ig molecule which is flexible and more exposed to enzymes is the

(A) Region between first and second constant regions of H chain (domains C_H1 and C_H2)
(B) Region between second and third constant regions of H chain (C_H2 and C_H3)
(C) Variable regions of H chain
(D) Variable regions of L chain

82. The smallest immunoglobulin is

(A) Ig G (B) Ig E
(C) Ig D (D) Ig A

83. The number of sub classes of Ig G is

(A) 2 (B) 3
(C) 4 (D) 8

84. Most abundant Ig G subclass in the serum is

(A) Ig G_1 (B) Ig G_2
(C) Ig G_3 (D) Ig G_4

85. The immunoglobulin which can cross the placenta is

(A) Ig A (B) Ig M
(C) Ig G (D) Ig D

86. The immunoglobulin possessing lowest concentration of carbohydrate is

(A) Ig A (B) Ig E
(C) Ig M (D) Ig G

87. The normal serum level of Ig G is

(A) 1200 mg% (B) 500 mg%
(C) 300 mg% (D) 200 mg%

88. The half life of Ig G is

(A) 2–8 days (B) 1–4 days
(C) 19–24 days (D) 6 days

89. Most heat labile immunoglobulin is

(A) Ig G (B) Ig A
(C) Ig M (D) Ig D

90. The immunoglobulin possessing highest concentration of carbohydrate is

(A) Ig G (B) Ig M
(C) Ig A (D) Ig D

91. The normal serum level of Ig D is

(A) 1 mg% (B) 2 mg%
(C) 3 mg% (D) 5 mg%

92. The half life of Ig D is

(A) 1 day (B) 2–8 days
(C) 10–15 days (D) 20–24 days

93. The carbohydrate content of Ig M is about

(A) 2.8% (B) 6.4%
(C) 8.0% (D) 10.2%

94. The immunoglobulin having highest sedimentation coefficient is

(A) Ig G (B) Ig A
(C) Ig M (D) Ig D

95. The immunoglobulin having highest molecular weight is

(A) Ig G (B) Ig M
(C) Ig E (D) Ig A

96. The half life of Ig M is

(A) 2 days (B) 4 days
(C) 5 days (D) 8 days

97. The normal serum level of Ig M is

(A) 50 mg% (B) 120 mg%
(C) 200 mg% (D) 300 mg%

98. The immunoglobulin associated with reginic antibody is

(A) Ig E (B) Ig D
(C) Ig M (D) Ig A

99. The immunoglobulin having least concentration in serum is

(A) Ig A (B) Ig M
(C) Ig D (D) Ig E

100. The half life of Ig E protein is

(A) 1–6 days (B) 2–8 days
(C) 10 days (D) 20 days

101. The immunoglobulin which provides highest antiviral activity is

(A) Ig D (B) Ig E
(C) Ig A (D) Ig G

102. The half life of Ig A is

(A) 6 days (B) 2–4 days
(C) 5–10 days (D) 12–20 days

103. The normal serum level of Ig A is

(A) 100 mg% (B) 200 mg%
(C) 300 mg% (D) 400 mg%

104. Calcium is excreted by

(A) Kidney
(B) Kidney and intestine
(C) Kidney and liver
(D) Kidney and pancreas

105. A decrease in the ionized fraction of serum calcium causes

(A) Tetany (B) Rickets
(C) Osteomalacia (D) Osteoporosis

106. A rise in blood calcium may indicate

(A) Paget's disease (B) Rickets
(C) Osteomalacia (D) Hypervitaminosis D

107. The normal serum level of phosphorus in human adult is

(A) 1–2 mg (B) 2–3 mg
(C) 3–4.5 mg (D) 5–7 mg

108. An increase in carbohydrate metabolism is accompanied by temporary decrease in serum:

(A) Calcium (B) Phosphate
(C) Iron (D) Sodium

109. In rickets of the common low-phosphate variety, serum phosphate values may go as low as

(A) 1–2 mg/100 ml (B) 2–3 mg/100 ml
(C) 3–4 mg/100 ml (D) 4–5 mg/100 ml

110. The normal serum level of phosphorous in children varies from

(A) 1–2 mg/100 ml (B) 2–3 mg/100 ml
(C) 3–4 mg/100 ml (D) 4–7 mg/100 ml

111. An inherited or acquired renal tubular defect in the reabsorption of phosphate (Vit D resistant ricket) is characterized with

(A) Normal serum Phosphate
(B) High serum phosphate
(C) A low blood phosphorous with elevated alkaline Phosphate
(D) A high blood phosphorous with decreased alkaline phosphatase

112. The total magnesium content in gms of human body is about

(A) 5 (B) 10
(C) 15 (D) 21

113. Iron is a component of

(A) Hemoglobin (B) Ceruloplasmin
(C) Transferase (D) Transaminase

114. Daily requirement of iron for normal adult male is about

(A) 5 mg (B) 10 mg
(C) 15 mg (D) 20 mg

115. The normal content of protein bound iron (PBI) in the plasma of males is

(A) 120–140 μg/100 ml
(B) 200–300 μg/100 ml
(C) 120–140 μg/100 ml
(D) 200–300 μg/100 ml

116. In iron deficiency anemia

(A) The plasma bound iron is low
(B) The plasma bound iron is high
(C) Total iron binding capacity is low
(D) Both the plasma bound iron and total iron binding capacity are low

117. The total iron content of the human body is

(A) 400–500 mg (B) 1–2 g
(C) 2–3 g (D) 4–5 g

118. In hepatic diseases

(A) Both the bound iron and total iron binding capacity of the plasma may be low
(B) Both the bound iron and total iron binding capacity of the plasma may be high
(C) Only bound iron may be high
(D) Only the total iron binding capacity may be high

119. The recommended daily requirement of iron for women of 18–55 yrs age is

(A) 5 mg (B) 8 mg
(C) 10 mg (D) 15 mg

120. The percent of total iron in body in hemoglobin is

(A) 10–20 (B) 20–30
(C) 30–40 (D) 60–70

121. A hypochromic microcytic anemia with increased iron stores in the bone marrow may be

(A) Iron responsive
(B) Pyridoxine responsive
(C) Vitamin B_{12} responsive
(D) Folate responsive

122. A good source of iron is

(A) Spinach (B) Milk
(C) Tomato (D) Potato

123. The best source of iron is

(A) Organ meats (B) Milk
(C) Tomato (D) Potato

124. An increased serum iron and decreased iron binding capacity is found in

(A) Fe deficiency anemia
(B) Sideroblastic anemia
(C) Folate deficiency anemia
(D) Sickle cell anemia

125. The absorption of iron is increased 2–10 times of normal in

(A) Iron deficiency anemia
(B) Pregnancy
(C) Spherocytosis
(D) Sickle cell anemia

126. Iron is mainly absorbed from

(A) Stomach and duodenum
(B) Ileum
(C) Caecum
(D) Colon

127. The iron containing nonporphyrin is

(A) Hemosiderin (B) Catalase
(C) Cytochrome C (D) Peroxidase

128. Molecular iron is

(A) Stored primarily in the spleen
(B) Exreted in the urine as Fe^{2+}
(C) Stored in the body in combination with ferritin
(D) Absorbed in the ferric form

129. In hemochromatosis, the liver is infiltrated with

(A) Iron (B) Copper
(C) Molybdenum (D) Fats

130. An acquired siderosis-Bantu siderosis is due to

(A) Foods cooked in iron pots
(B) Diet high in phosphorous
(C) Diet high in calcium
(D) High fat diet

131. The amount of copper in the human body is

(A) 50–80 mg (B) 100–150 mg
(C) 400–500 mg (D) 500–1000 mg

132. The amount of copper in muscles is about

(A) 10 mg (B) 30 mg
(C) 64 mg (D) 100 mg

133. The amount of copper in bones is about

(A) 5 mg (B) 10 mg
(C) 15 mg (D) 23 mg

134. The normal serum of concentration of copper in mg/100 ml varies between

(A) 0–5 (B) 50–100
(C) 100–200 (D) 200–300

135. The normal serum concentration of ceruloplasmin in mg/100 ml varies between

(A) 5–10 (B) 10–20
(C) 25–43 (D) 50–100

136. Recommended daily dietary requirement of copper for adults is

(A) 0.5–1 mg (B) 1.5–3.0 mg
(C) 3.5–4.5 mg (D) 4.5–5.5 mg

137. The richest source of copper is

(A) Liver
(B) Milk
(C) Legumes
(D) Green leafy vegetables

138. The cytosolic superoxide dismutase enzyme contains

(A) Cu^{2+} (B) Cu^{2+} and Zn^{2+}
(C) Zn^{2+} (D) Mn^{2+}

139. The deficiency of copper decreases the activity of the enzyme:

(A) Lysine oxidase (B) Lysine hydroxylase
(C) Tyrosine oxidase (D) Proline hydroxylase

140. Wilson's disease is a condition of toxicosis of

(A) Iron (B) Copper
(C) Chromium (D) Molybdenum

141. In Wilson's disease

(A) Copper fails to be excreted in the bile
(B) Copper level in plasma is decreased
(C) Ceruloplasmin level is increased
(D) Intestinal absorption of copper is decreased

142. Menke's disease is due to an abnormality in the metabolism of

(A) Iron (B) Manganese
(C) Magnesium (D) Copper

143. Menke's disease (Kinky or steel hair disease) is a X-linked disease characterized by

(A) High levels of plasma copper
(B) High levels of ceruloplasmin
(C) Low levels of plasma copper and of ceuloplasmin
(D) High level of hepatic copper

144. The trace element catalyzing hemoglobin synthesis is

(A) Manganese (B) Magnesium
(C) Copper (D) Selenium

145. The total body content of manganese is about

(A) 2 mg (B) 4 mg
(C) 8 mg (D) 10 mg

146. In blood the values of manganese in μg / 100 ml varies between

(A) 0–4 (B) 2–4
(C) 3–5 (D) 4–20

147. The adequate daily dietary requirement of manganese is

(A) 1–2 mg (B) 2–5 mg
(C) 5–10 mg (D) 10–20 mg

148. Mitochondrial superoxide dismutase contains

(A) Zinc (B) Copper
(C) Magnesium (D) Manganese

149. Mitochondrial pyruvate carboxylase contains

(A) Zinc (B) Zinc
(C) Manganese (D) Magnesium

150. The adequate daily dietary requirement of molybdenum for normal human adult is

(A) 10–20 μg (B) 25–50 μg
(C) 50–70 μg (D) 75–200 μg

151. In human beings molybdenum is mainly absorbed from

(A) Liver (B) Kidney
(C) Intestine (D) Pancreas

152. In human beings molybdenum is mainly excreted in

(A) Feces (B) Sweat
(C) Urine (D) Tears

153. Molybdenum is a constituent of

(A) Hydroxylases (B) Oxidases
(C) Transaminases (D) Transferases

154. Safe and adequate daily dietary intake of chromium in adults in mg is

(A) 0.01–0.02 (B) 0.02–0.03
(C) 0.03–0.04 (D) 0.05–0.2

155. Richest source of chromium is

(A) Brewer's yease
(B) Milk and milk products
(C) Yellow vegetables
(D) Green vegetables

156. Metallic constituent of "Glucose tolerance factor" is

(A) Sulphur (B) Cobalt
(C) Chromium (D) Selenium

157. Intestinal absorption of chromium is shared with

(A) Mn (B) Mg
(C) Ca (D) Zn

158. Serum level of chromium in healthy adult is about

(A) 2-5 μg/100 ml (B) 6-20 μg/100 ml
(C) 30-60 μg/100 ml (D) 50-100 μg/100 ml

159. Chromium is potentiator of

(A) Insulin (B) Glucagon
(C) Thyroxine (D) Parathromone

160. Recommended daily dietary allowance of selenium for adult human in μg is

(A) 20 (B) 40
(C) 50 (D) 70

161. Total body content of selenium is about

(A) 1–2 mg (B) 2–4 mg
(C) 4–10 mg (D) 50–100 mg

162. Normal serum level of selenium is

(A) 5 μg /100 ml (B) 8 μg /100 ml
(C) 10 μg /100 ml (D) 13 μg /100 ml

163. Selenium is a constituent of the enzyme:

(A) Glutathione peroxidase
(B) Homogentisate oxidase
(C) Tyrosine hydroxylase
(D) Phenylalanin hydroxylase

164. A nonspecific intracellular antioxidant is

(A) Chromium (B) Magnesium
(C) Selenium (D) Nickel

165. Cobalt forms an integral part of the vitamin:

(A) B_1 (B) B_6
(C) B_{12} (D) Folate

166. Cobalt may act as cofactor for the enzyme:

(A) Glycl-glycine dipeptidase
(B) Elastase
(C) Polynucleotidases
(D) Phosphatase

167. Excess intake of cobalt for longer periods leads to

(A) Polycythemia
(B) Megaloblastic anemia
(C) Pernicious anemia
(D) Microcytic anemia

168. The total sulphur content of the body is

(A) 25–50 gm (B) 50–75 gm
(C) 100–125 gm (D) 150–200 gm

169. Sulphur is made available to the body by the amino acids:

(A) Cystine and methionine
(B) Taurine and alanine
(C) Proline and hydroxyproline
(D) Arginine and lysine

170. Sulphur containing coenzyme is

(A) NAD
(B) FAD
(C) Pyridoxal phosphate
(D) Biotin

171. Iodine is stored in

(A) Thyroid gland as thyroglobulin
(B) Liver
(C) Intestine
(D) Skin

172. Iodine is the constituent of

(A) T_3 and T_4 (B) PTH
(C) Insulin (D) Adrenaline

173. Goitrogenic substance present in cabbage is

(A) 5-vinyl-2 thio oxalzolidone
(B) Pyridine-3-carboxylic acid
(C) 3-Hydroxy-4, 5-dihydroxymethyl1–2-methyl pyridine
(D) δ-ALA dehydratase

174. For an adult male daily requirement of iodine is

(A) 25–50 μg (B) 50–100 μg
(C) 100–150 μg (D) 200–250 μg

175. Recommended daily intake of fluoride for a normal adult is

(A) 1.5–4.0 mg (B) 0–1 mg
(C) 5–10 mg (D) 10–20 mg

176. The percentage of fluoride present in normal bone is

(A) 0.01–0.03 (B) 0.04–0.08
(C) 0.10–0.12 (D) 0.15–0.2

177. The percentage of fluoride present in dental enamel is

(A) 0.01–0.02 (B) 0.05–0.10
(C) 0.15–0.20 (D) 0.20–0.40

178. Fluorosis occurs due to

(A) Drinking water containing less than 0.2 ppm of fluorine
(B) Drinking water containing high calcium
(C) Drinking water containing greater than 1.2 ppm of fluroine
(D) Drinking water containing heavy metals

179. Dental caries occur due to

(A) Drinking water containing less than 0.2 ppm of fluorine
(B) Drinking water containing greater than 1.2 ppm of fluorine
(C) Drinking water containing high calcium
(D) Drinking water containing heavy metals

180. Total zinc content of human body is about

(A) 800 mg (B) 1200 mg
(C) 2000 mg (D) 3200 mg

181. Metal required for polymerization of insulin is

(A) Copper (B) Chromium
(C) Cobalt (D) Zinc

182. Metalloenzyme-retinene for polymerization of insulin is

(A) Copper (B) Zinc
(C) Cobalt (D) Manganese

183. An important zinc containing enzyme is

(A) Carboxypeptidase A
(B) Isocitrate dehydrogenase
(C) Cholinesterate
(D) Lipoprotein lipase

184. Acrodermatitis enteropathica is due to defective absorption of

(A) Manganese (B) Molybdenum
(C) Iodine (D) Zinc

185. Hypogonadism develops due to deficiency of

(A) Sulphur (B) Cobalt
(C) Zinc (D) Manganese

186. Psychotic symptoms and parkinsonism like symptoms develop due to inhalation poisoning of

(A) Manganese (B) Phosphorous
(C) Magnesium (D) Zinc

187. One gram of carbohydrate on complete oxidation in the body yields about

(A) 1 Kcal (B) 4 Kcal
(C) 6 Kcal (D) 9 Kcal

188. One gram of fat on complete oxidation in the body yields about

(A) 4 Kcal (B) 6 Kcal
(C) 9 Kcal (D) 12 Kcal

189. One gram of protein on complete oxidation in the body yields about

(A) 2 Kcal (B) 4 Kcal
(C) 8 Kcal (D) 12 Kcal

190. R.Q. of mixed diet is about

(A) 0.70 (B) 0.80
(C) 0.85 (D) 1.0

191. R.Q. of proteins is about

(A) 0.70 (B) 0.75
(C) 0.80 (D) 0.85

192. R.Q. of carbohydrates is about

(A) 0.75 (B) 0.80
(C) 0.85 (D) 1.0

193. R.Q. of fats is about

(A) 0.75 (B) 0.80
(C) 0.85 (D) 1.0

194. Proteins have the SDA:

(A) 5% (B) 10%
(C) 20% (D) 30%

195. Humans most easily tolerate a lack of the nutrient:

(A) Protein (B) Lipid
(C) Iodine (D) Carbohydrate

196. The basal metabolic rate (B.M.R.) is measurement of

(A) Energy expenditure during sleep
(B) Energy expenditure after 100 m walk
(C) Energy expenditure after a meal
(D) Energy expenditure under certain basal (Standard) conditions

197. B.M.R. is raised in

(A) Polycythemia (B) Starvation
(C) Lipid nephrosis (D) Hypothyroidism

198. B.M.R. is lowered in

(A) Hypothyroidism (B) Leukemia
(C) Cardiac failure (D) Hyperthyroidism

199. B.M.R. is subnormal in

(A) Addison's disease
(B) Adrenal tumour
(C) Cushing's syndrome
(D) Fever

200. A healthy 70 kg man eats a well balanced diet containing adequate calories and 62.5 g of high quality protein per day. Measured in grams of nitrogen, his daily nitrogen balance would be

(A) +10 g (B) +6.25 g
(C) 0 g (D) –6.25 g

201. The percentage of nitrogen retained in the body after absorption of diet represents

(A) Digestibility coefficient of proteins
(B) Biological value of proteins
(C) Protein efficiency ratio
(D) Net protein utilisation

202. In a person increase in weight in gms per gm of protein consumption represents

(A) Protein efficiency ratio
(B) Digestibility value of proteins
(C) Biological value of proteins
(D) Net protein utilisation

203. The percentage of food nitrogen that is retained in the body represents

(A) Digestibility coefficient
(B) Biological value of proteins
(C) Protein efficiency ratio
(D) Net protein utilisation

204. The chemical score of different proteins is calculated in terms of

(A) Egg proteins (B) Milk proteins
(C) Fish proteins (D) Wheat proteins

205. Biological value of egg protein is

(A) 94 (B) 60
(C) 51 (D) 40

206. Biological value of protein of cow's milk is

(A) 95 (B) 60
(C) 71 (D) 67

207. Biological value of soyabean protein is

(A) 86 (B) 71
(C) 64 (D) 54

208. Plasma bicarbonate is decreased in

(A) Respiratory alkalosis
(B) Respiratory acidosis
(C) Metabolic alkalosis
(D) Metabolic acidosis

209. Plasma bicarbonate is increased in

(A) Respiratory alkalosis
(B) Metabolic alkalosis
(C) Respiratory acidosis
(D) Metabolic acidosis

210. Total CO_2 is increased in

(A) Respiratory acidosis
(B) Metabolic alkalosis
(C) Both respiratory acidosis and metabolic alkalosis
(D) Respiratory alkalosis

211. Respiratory acidosis is caused by

(A) Increase in carbonic acid relative to bicarbonate
(B) Decrease in bicarbonate fraction
(C) Increase in bicarbonate fraction
(E) Decrease in the carbonic acid fraction

212. Respiratory alkalosis is caused by

(A) An increase in carbonic acid fraction
(B) A decrease in bicarbonic fraction
(C) A decrease in the carbonic acid fraction
(D) An increase in bicarbonate fraction

213. Meningitis and encephalitis cause

(A) Metabolic alkalosis
(B) Respiratory alkalosis
(C) Metabolic acidosis
(D) Respiratory acidosis

214. Metabolic acidosis is caused in

(A) Uncontrolled diabetes with ketosis
(B) Pneumonia
(C) Intestinal Obstruction
(D) Hepatic coma

215. Metabolic acidosis is caused in

(A) Pneumonia
(B) Prolonged starvation
(C) Intestinal obstruction
(D) Bulbar polio

216. Respiratory acidosis occurs in

(A) Any disease which impairs respiration like emphysema
(B) Renal disease
(C) Poisoning by an acid
(D) Pyloric stenosis

217. Metabolic alkalosis occurs

(A) As consequence of high intestinal obstruction
(B) In central nervous system disease
(C) In diarrhoea
(D) In colitis

218. Respiratory alkalosis occurs in

(A) Hysterical hyperventilation
(B) Depression of respiratory centre
(C) Renal diseases
(D) Loss of intestinal fluids

219. Morphine poisoning causes

(A) Metabolic acidosis
(B) Respiratory acidosis
(C) Metabolic alkalosis
(D) Respiratory alkalosis

220. Salicylate poisoning in early stages causes

(A) Metabolic acidosis
(B) Respiratory acidosis
(C) Metabolic alkalosis
(D) Respiratory alkalosis

221. The compound having the lowest redox potential amongst the following is

(A) Hydrogen (B) NAD
(C) Cytochrome b (D) Cytochrome a

222. All the oxidases contain a metal which is

(A) Copper (B) FAD
(C) Manganese (D) None of these

223. Isocitrate dehydrogenases is

(A) Aerobic dehydrogenase
(B) Anaerobic dehydrogenase
(C) Hydroperoxidase
(D) Oxygenase

224. Iron-pophyrin is present as prosthetic group in

(A) Cytochromes (B) Catalases
(C) Peroxidase (D) None of these

225. Microsomal hydroxylase system contains a

(A) Di-oxygenase (B) Mono-oxygenase
(C) Both (A) and (B) (D) None of thse

226. Superoxide radicals can be detoxified by

(A) Cytochrome c (B) Cytochrome b
(C) Cytochrome a (D) None of these

227. A copper containing cytochrome is

(A) Cytochrome a (B) Cytochrome P-450
(C) Cytochrome a_3 (D) None of these

228. Rate of tissue respiration is raised when the intracellular concentration of

(A) ADP increases (B) ATP increases
(C) ADP decreases (D) None of these

229. Which of the following component of respiratory chain is not attached to the inner mitochondrial membrane?

(A) Coenzyme Q (B) Cytochrome c
(C) Both (A) and (B) (D) None of these

230. In some reactions, energy is captured in the form of

(A) GTP (B) UTP
(C) CTP (D) None of these

231. Substrate-linked phosphorylation occurs in

(A) Glycolytic pathway (B) Citric acid cycle
(C) Both (A) and (B) (D) None of these

232. Hydrogen peroxide may be detoxified in the absence of an oxygen acceptor by

(A) Peroxidase (B) Catalase
(C) Both (A) and (B) (D) None of these

233. Superoxide radicals can be detoxified by

(A) Cytochrome c
(B) Superoxide dismutase
(C) Both (A) and (B)
(D) None of these

234. The porphyrin present in haem is

(A) Uroporphyrin (B) Protoporphyrin I
(C) Coproporphyrin (D) Protoporphyrin II

235. An amino acid required for porphyrin synthesis is

(A) Proline (B) Glycine
(C) Serine (D) Histidine

236. Which of the following coenzyme is required for porphyrin synthesis?

(A) Coenzyme A
(B) Pyridoxal phosphate
(C) Both (A) and (B)
(D) None of these

237. The regulatory enzyme for haem synthesis is

(A) ALA synthetase
(B) haem synthetase
(C) Both (A) and (B)
(D) None of these

238. Regulation of haem synthesis occurs by

(A) Covalent modification
(B) Repression - derepression
(C) Induction
(D) Allosteric regulation

239. Sigmoidal oxygen dissociation curve is a property of

(A) Haemoglobin
(B) Carboxyhaemoglobin
(C) Myoglobin
(D) Methaemoglobin

240. Cyanmethaemoglobin can be formed from

(A) Oxy Hb (B) Met Hb
(C) Carboxy Hb (D) All of these

241. In thalassemia, an amino acid is substituted in

(A) Alpha chain
(B) Beta chain
(C) Alpha and beta chains
(D) Any chain

242. Haem synthetase is congenitally deficient in

(A) Congenital erythropoietic porphyria
(B) Protoporphyria
(C) Hereditary coproporphyria
(D) Variegate porphyria

243. During breakdown of haem, the methenyl bridge between the following two pyrrole rings is broken:

(A) I and II (B) II and III
(C) III and IV (D) IV and I

244. Pre- hepatic jaundice occurs because of

(A) Increased haemolysis
(B) Liver damage
(C) Biliary obstruction
(D) None of these

245. kernicterus can occur in

(A) Haemolytic jaundice
(B) Hepatic jaundice
(C) Obstructive jaundice
(D) All of these

246. Bile pigments are not present in urine in

(A) Haemolytic jaundice
(B) Hepatic jaundice
(C) Obstructive jaundice
(D) Rotor's syndrome

247. Serum alkaline phosphatase is greatly increased in

(A) Haemolytic jaundice
(B) Hepatic jaundice
(C) Obstructive jaundice
(D) None of these

248. The active transport system for hepatic uptake of bilirubin is congenitally defective in

(A) Gilbert's disease
(B) Crigler-Najjar syndrome
(C) Rotor's syndrome
(D) Dubin-Johnson syndrome

249. Bilirubin UDP-glucuronyl transferase is absent from liver in

(A) Crigler-Najjar syndrome, type I
(B) Gilbert's disease
(C) Crigler-Najjar syndrome, type II
(D) Rotor's syndrome

250. Unconjugated bilirubin in serum is soluble in

(A) Water (B) Alkalis
(C) Acids (D) Methanal

251. Excretion of conjugated bilirubin from liver cells into biliary canaliculi is defective in

(A) Gilbert's disease
(B) Crigler-Najjar syndrome
(C) Lucey-Driscoll syndrome
(D) Rotor's syndrome

252. Breakdown of 1gm haemoglobin produces

(A) 20 mg of bilirubin (B) 35 mg of bilirubin
(C) 50 mg of bilirubin (D) 70 mg of bilirubin

253. Variable regions are present in

(A) Immunoglobulins
(B) α-Chains of T cell receptors
(C) β-Chains of T cell receptors
(D) All of these

254. The total amount of calcium in an average adult man is about

(A) 100 gm (B) 500 gm
(C) 1 kg (D) 10 kg

255. The following proportion of the total body calcium is present in bones and teeth:

(A) 75% (B) 90%
(C) 95% (D) 99%

256. The normal range of plasma calcium is

(A) 3-5 mg/dl (B) 5-10 mg/dl
(C) 9-11 mg/dl (D) 11-15 mg/dl

257. Which of the normal range of ionized calcium in plasma is

(A) 2-4 mg/dl (B) 2-4 mEq/L
(C) 4-5 mg/dl (D) 4-5 mEq/L

258. Tetany can occur in

(A) Hypocalcaemia
(B) Hypercalcaemia
(C) Alkalosis
(D) Hypocalcaemia and alkalosis

259. Intestinal absorption of calcium occurs by

(A) Active takeup
(B) Simple diffusion
(C) Facilitated diffusion
(D) Endocytosis

260. Intestinal absorption of calcium is hampered by

(A) Phosphate (B) Phytate
(C) Proteins (D) Lactose

261. Calcitriol facilitates calcium absorption by increasing the synthesis of the following in intestinal mucosa:

(A) Calcium Binding Protein
(B) Alkaline Phosphatase
(C) Calcium-dependent ATPase
(D) All of these

262. A high plasma calcium level decreases intestinal absorption of calcium by

(A) Stimulating the secretion of parathormone
(B) Inhibiting the secretion of parathormone
(C) Decreasing the synthesis of cholecalciferol
(D) Inhibiting the secretion of thyrocalcitonin

263. The daily calcium requirement of an adult man is about

(A) 400 mg (B) 600 mg
(C) 800 mg (D) 1,000 mg

264. The daily calcium requirement in pregnancy and lactation is about

(A) 600 mg (B) 800 mg
(C) 1,200 mg (D) 1,500 mg

265. Hypercalcaemia can occur in all the following except

(A) Hyperparathyroidism
(B) Hypervitaminosis D
(C) Milk alkali syndrome
(D) Nephrotic syndrome

266. Hypocalcaemia can occur in all the following except

(A) Rickets
(B) Osteomalacia
(C) Hyperparathyroidism
(D) Intestinal malabsorption

267. The major calcium salt in bones is

(A) Calcium carbonate
(B) Calcium chloride
(C) Calcium hydroxide
(D) Calcium phosphate

268. The correct statement about serum inorganic phosphorous concentration is

(A) It is higher in men than in women
(B) It is higher in women than in men
(C) It is higher in adults than in children
(D) It is higher in children than in adults

269. The product of serum calcium concentration (mg/dl) and serum inorganic phosphorous concentration (mg/dl) in adults is about

(A) 30 (B) 40
(C) 50 (D) 60

270. The product of serum calcium concentration (mg/dl) and serum inorganic phosphorous concentration (mg/dl) in children is about

(A) 30 (B) 40
(C) 50 (D) 60

271. The product of serum calcium concentration (mg/dl) and serum inorganic phosphorous concentration (mg/dl) is decreased in

(A) Rickets
(B) Hypoparathyroidism
(C) Hyperparathyroidism
(D) Renal failure

272. Serum inorganic phosphorous rises in all the following conditions except

(A) Hypoparathyroidism
(B) Hypervitaminosis D
(C) Chronic renal failure
(D) After a carbohydrate-rich meal

273. Serum inorganic phosphorous decreases in all the following conditions except

(A) Hyperparathyroidism
(B) Intestinal malabsorption
(C) Osteomalacia
(D) Chronic renal failure

274. Serum magnesium level ranges between

(A) 2–3 mg/dl (B) 3–5 mg/dl
(C) 6–8 mg/dl (D) 9–11 mg/dl

275. Magnesium ions are required in the reactions involving

(A) NAD (B) FAD
(C) ATP (D) CoA

276. Normal range of serum sodium is

(A) 30–70 mEq/L (B) 70–110 mEq/L
(C) 117–135 mEq/L (D) 136–145 mEq/L

277. Sodium is involved in the active uptake of

(A) D-Glucose (B) D-Galactose
(C) L-Amino acids (D) All of these

278. Aldosterone increases reabsorption of sodium in

(A) Proximal convoluted tubules
(B) Ascending limb of loop of Henle
(C) Descending limb of loop of Henle
(D) Distal convoluted tubules

279. Restriction of sodium intake is commonly advised in

(A) Addison's disease (B) Diarrhoea
(C) Hypertension (D) None of these

280. Serum sodium level rises in all of the following except

(A) Renal failure
(B) Prolonged steroid therapy
(C) Aldosteronism
(D) Dehydration

281. Hyponatraemia occurs in the following condition:

(A) Addison's disease (B) Chronic renal failure
(C) Severe diarrhoea (D) All of these

282. Serum potassium level decreases in

(A) Familial periodic paralysis
(B) Addison's disease
(C) Renal failure
(D) All of these

283. Concentration of the following is higher in intracellular fluid than in extracellular fluid:

(A) Sodium (B) Potassium
(C) Chloride (D) Bicarbonate

284. Normal range of serum potassium is

(A) 2.1-3.4 mEq/L (B) 3.5-5.3 mEq/L
(C) 5.4–7.4 mEq/L (D) 7.5–9.5 mEq/L

285. Normal range of serum chloride is

(A) 24–27 mEq/L (B) 70–80 mEq/L
(C) 100–106 mEq/L (D) 120–140 mEq/L

286. An extracellular fluid having a higher concentration of chloride than serum is

(A) Bile (B) Sweat
(C) CSF (D) Pancreatic juice

287 Total amount of iron in an adult man is about

(A) 1–2 gm (B) 2–3 gm
(C) 3–4 gm (D) 6–7 gm

288. Haemoglobin contains about

(A) 30% of the total body iron
(B) 50% of the total body iron
(C) 75% of the total body iron
(D) 90% of the total body iron

289. About 5% of the total body, iron is present in

(A) Transferrin (B) Myoglobin
(C) Cytochromes (D) Haemosiderin

290. Each haemoglobin molecule contains

(A) One iron atom (B) Two iron atoms
(C) Four iron atoms (D) Six iron atoms

291. Each myoglobin molecule contains

(A) One iron atom (B) Two iron atoms
(C) Four iron atoms (D) Six iron atoms

292. Apoferritin molecule is made up of

(A) Four subunits (B) Eight subunits
(C) Ten subunits (D) Twenty-four subunits

293. Ferritin is present in

(A) Intestinal mucosa (B) Liver
(C) Spleen (D) All of these

294. Iron is stored in the form of

(A) Ferritin and transferrin
(B) Transferrin and haemosiderin
(C) Haemoglobin and myoglobin
(D) Ferritin and haemosiderin

295. Iron is transported in blood in the form of

(A) Ferritin (B) Haemosiderin
(C) Transferrin (D) Haemoglobin

296. Molecular weight of transferrin is about

(A) 40,000 (B) 60,000
(C) 80,000 (D) 1,00,000

297. Normal plasma iron level is

(A) 50100 μg/dl (B) 100150 μg/dl
(C) 50175 μg/dl (D) 250400 μg/dl

298. Iron is present in all the following except

(A) Peroxidase (B) Xanthine oxidase
(C) Aconitase (D) Fumarase

299. Total daily iron loss of an adult man is about

(A) 0.1 mg (B) 1 mg
(C) 5 mg (D) 10 mg

300. Iron absorption is hampered by

(A) Ascorbic acid (B) Succinic acid
(C) Phytic acid (D) Amino acid

301. Iron absorption is hampered by

(A) In achlorhydria
(B) When ferritin content of intestinal mucosa is low
(C) When saturation of plasma transferring is low
(D) When erythropoietic activity is increased

302. Daily iron requirement of an adult man is about

(A) 1 mg (B) 5 mg
(C) 10 mg (D) 18 mg

303. Daily iron requirement of a woman of reproductive age is about

(A) 1 mg (B) 2 mg
(C) 10 mg (D) 20 mg

304. All the following are good sources of iron except

(A) Milk (B) Meat
(C) Liver (D) Kidney

305. Relatively more iron is absorbed from

(A) Green leafy vegetables
(B) Fruits
(C) Whole grain cereals
(D) Organ meats

306. Iron absorption from a mixed diet is about

(A) 1–5 % (B) 5–10 %
(C) 20–25 % (D) 25–50 %

307. Iron deficiency causes

(A) Normocytic anaemia
(B) Microcytic anaemia
(C) Megaloblastic anaemia
(D) Pernicious anaemia

308. Prolonged and severe iron deficiency can cause astrophy of epithelium of

(A) Oral cavity (B) Oesophagus
(C) Stomach (D) All of these

309. All of the following statements about bronzed diabetes are true except

(A) It is caused by excessive intake of copper
(B) Skin becomes pigmented
(C) There is damage to β cells of Islets of Langerhans
(D) Liver is damaged

310. The total amount of iodine in the body of an average adult is

(A) 10–15 mg (B) 20–25 mg
(C) 45–50 mg (D) 75–100 mg

311. Iodine content of thyroid gland in an adult is about

(A) 1–3 mg (B) 4–8 mg
(C) 10–15 mg (D) 25–30 mg

312. Daily iodine requirement of an adult is about

(A) 50 μg (B) 100 μg
(C) 150 μg (D) 1 mg

313. Consumption of iodised salt is recommended in

(A) Patients with hyperthyroidism
(B) Patients with hypothyroidism
(C) Pregnant women
(D) Goitre belt areas

314. All the following statements about endemic goiter are true except

(A) It occurs in areas where soil and water have low iodine content
(B) It leads to enlargement of thyroid gland
(C) It results ultimately in hyperthyroidism
(D) It can be prevented by consumption of iodised salt

315. The total amount of copper in the body of an average adult is

(A) 1 gm (B) 500 mg
(C) 100 mg (D) 10 mg

316. The normal range of plasma copper is

(A) 25–50 μg/dl (B) 50–100 μg/dl
(C) 100–200 μg/dl (D) 200–400 μg/dl

317. Copper deficiency can cause

(A) Polycythaemia (B) Leukocytopenia
(C) Thrombocytopenia (D) Microcytic anaemia

318. Daily requirement of copper in adults is about

(A) 0.5 mg (B) 1 mg
(C) 2.5 mg (D) 5 mg

319. All the following statements about ceruloplasmin are correct except

(A) It is a copper-containing protein
(B) It possesses oxidase activity
(C) It is synthesised in intestinal mucosa
(D) Its plasma level is decreased inWilson's disease

320. All the following statements about Wilson's disease are correct except

(A) It is a genetic disease
(B) The defect involves copper-dependent P-type ATPase
(C) Copper is deposited in liver, basal ganglia and around cornea
(D) Plasma copper level is increased in it

321. Which of the following statements about Menke's disease are true.

(A) It is an inherited disorder of copper metabolism
(B) It occurs only in males
(C) Plasma copper is increased in it
(D) Hair becomes steely and kinky in it

322. The total amount of zinc in an average adult is

(A) 0.25–0.5 gm (B) 0.5–1.0 gm
(C) 1.5–2.0 gm (D) 2.5–5.0 gm

323. Plasma zinc level is

(A) 10–50 μg/dl (B) 50–150 μg/dl
(C) 150–250 μg/dl (D) 250–500 μg/dl

324. Zinc is a cofactor for

(A) Acid phosphatase
(B) Alkaline phosphatase
(C) Amylase
(D) Lipase

325. Zinc is involved in storage and release of

(A) Histamine (B) Acetylcholine
(C) Epinephrine (D) Insulin

326. Intestinal absorption of zinc is retarded by

(A) Calcium (B) Cadmium
(C) Phytate (D) All of these

327. The daily zinc requirement of an average adult is

(A) 5 mg (B) 10 mg
(C) 15 mg (D) 25 mg

328. Zinc deficiency occurs commonly in

(A) Acrodermatitis enteropathica
(B) Wilson's disease
(C) Xeroderma pigmentosum
(D) Menke's disease

329. Hypogonadism can occur in deficiency of

(A) Copper (B) Chromium
(C) Zinc (D) Manganese

330. Healing of wounds may be impaired in deficiency of

(A) Selenium (B) Copper
(C) Zinc (D) Cobalt

331. Hypochromic microcytic anaemia can occur in

(A) Zinc (B) Copper
(C) Manganese (D) None of these

332. The daily requirement for manganese in adults is about

(A) 1–2 mg (B) 2–5 mg
(C) 2–5 µg (D) 5–20 µg

333. Molybdenum is a cofactor for

(A) Xanthine oxidase (B) Aldehyde oxidase
(C) Sulphite oxidase (D) All of these

334. A trace element having antioxidant function is

(A) Selenium (B) Tocopherol
(C) Chromium (D) Molybdenum

335. Selenium is a constituent of

(A) Glutathione reductase
(B) Glutathione peroxidase
(C) Catalase
(D) Superoxide dismutase

336. Selenium decreases the requirement of

(A) Copper (B) Zinc
(C) Vitamin D (D) Vitamin E

337. Upper safe limit of fluorine in water is

(A) 0.4 ppm (B) 0.8 ppm
(C) 1.2 ppm (D) 2 ppm

338. The daily fluoride intake should not exceed

(A) 0.5 mg (B) 1 mg
(C) 2 mg (D) 3 mg

339. In adults, water constitutes about

(A) 50% of body weight
(B) 55% of body weight
(C) 60% of body weight
(D) 75% of body weight

340. 1 kcal is roughly equal to

(A) 4.2 J (B) 42 J
(C) 4.2 KJ (D) 42 KJ

341. Calorific value of proteins as determined in a bomb calorimeter is

(A) 4 kcal/gm (B) 4.8 kcal/gm
(C) 5.4 kcal/gm (D) 5.8 kcal/gm

342. Calorific value of proteins in a living person is less than that in a bomb calorimeter because

(A) Digestion and absorption of proteins is less than 100%
(B) Respiratory quotient of proteins is less than 1
(C) Specific dynamic action of proteins is high
(D) Proteins are not completely oxidized in living persons

343. Calorific value of alcohol is

(A) 4 kcal/gm (B) 5.4 kcal/gm
(C) 7 kcal/gm (D) 9 kcal/gm

344. Energy expenditure of a person can be measured by

(A) Bomb calorimetry
(B) Direct calorimetry
(C) Indirect calorimetry
(D) Direct or indirect calorimetry

345. Respiratory quotient of carbohydrates is about

(A) 0.5 (B) 0.7
(C) 0.8 (D) 1.0

346. Respiratory quotient of fats is about

(A) 0.5 (B) 0.7
(C) 0.8 (D) 1.0

347. Respiratory quotient of proteins is about

(A) 0.5 (B) 0.7
(C) 0.8 (D) 1.0

348. Respiratory quotient of an average mixed diet is about

(A) 0.65 (B) 0.7
(C) 0.75 (D) 0.85

349. At a respiratory quotient of 0.85, every litre of oxygen consumed represents an energy expenditure of

(A) 5.825 kcal (B) 4.825 kcal
(C) 3.825 kcal (D) 2.825 kcal

350. BMR of healthy adult men is about

(A) 30 kcal/hour/square metre
(B) 35 kcal/hour/square metre
(C) 40 kcal/hour/square metre
(D) 45 kcal/hour/square metre

351. BMR of healthy adult women is about

(A) 32 kcal/hour/square metre
(B) 36 kcal/hour/square metre
(C) 40 kcal/hour/square metre
(D) 44 kcal/hour/square metre

352. BMR is higher in

(A) Adults than in children
(B) Men than in women
(C) Vegetarians than in non-vegetarians
(D) Warmer climate than in colder climate

353. BMR is decreased in

(A) Pregnancy (B) Starvation
(C) Anaemia (D) Fever

354. BMR is increased in

(A) Starvation (B) Hypothyroidism
(C) Addison's disease (D) Pregnancy

355. BMR is decreased in all of the following except

(A) Fever (B) Addison's disease
(C) Starvation (D) Hypothyroidism

356. BMR is increased in all of the following except

(A) Hyperthyroidism (B) Anaemia
(C) Addison's disease (D) Pregnancy

357. Specific dynamic action of carbohydrates is about

(A) 5% (B) 13%
(C) 20% (D) 30%

358. Specific dynamic action of proteins is about

(A) 5% (B) 13%
(C) 20% (D) 30%

359. All following are essential trace elements except

(A) Iron (B) Iodine
(C) Zinc (D) Cadmium

360. Maximum quantity of sodium is excreted through

(A) Urine (B) Faeces
(C) Sweat (D) None of these

361. All followings are rich sources of magnesium, except

(A) Milk (B) Eggs
(C) Meat (D) Cabbage

362. All followings are poor sources of iron except

(A) Milk (B) Potatoes
(C) Wheat flour (D) Liver

363. The Iron deficient children, absorption of Iron from GIT is

(A) Unaltered
(B) Double than in normal child
(C) Manifold than in normal child
(D) Lesser than in normal child

364. Main source of fluoride for human beings is

(A) Milk (B) Water
(C) Vegetables (D) Eggs

365. Quantity of copper present in the body of an adult is

(A) 0–50 mg (B) 50–100 mg
(C) 100–150 mg (D) 150–250 mg

366. A level of 310–340 mg per 1000 ml of blood is normal for the

(A) Copper (B) Iron
(C) Potassium (D) Sodium

367. Daily requirement of phosphorous for an infant is

(A) 240–400 mg (B) 1.2 gms
(C) 800 mg (D) 800–1200 mg

368. Maximum quantity of Zinc is present in the body in

(A) Prostate (B) Choroid
(C) Skin (D) Bones

369. Average concentration of chloride ions in cerebrospinal fluid per 100 ml is

(A) 40 mg (B) 440 mg
(C) 160 mg (D) 365 mg

370. Total iron content of the normal adult is

(A) 1-2 gm (B) 3-4 gm
(C) 4-5 gm (D) 7-10 gm

371. Absorption of phosphorous from diet is favoured by

(A) Moderate amount of fat
(B) Acidic environment
(C) High calcium content
(D) High phytic acid

372. Daily intake of potassium for a normal person should be

(A) 1 gm (B) 2 gm
(C) 3 gm (D) 4 gm

373. Absorption of calcium decreases if there is high concentration in the diet of

(A) Copper (B) Sodium
(C) Magnesium (D) Cadmium

374. Of the following highest concentration of calcium is seen in

(A) Blood (B) CSF
(C) Muscle (D) Nerve

375. Cobalt is essential component of

(A) Vitamin B_1 (B) Vitamin B_6
(C) Vitamin B_{12} (D) All of these

376. Iodine is required in human body for

(A) Formation of thyroxine
(B) Formation of Glutathione
(C) Formation of potassium iodide
(D) Adrenalin

377. A hypochromic necrocytic anaemia with increase Fe stores in the bone marrow may be

(A) Folic acid responsive
(B) Vitamin B_{12} responsive
(C) Pyridoxine responsive
(D) Vitamin C responsive

378. A deficiency of copper effects the formation of normal collagen by reducing the activity of which of the following enzyme?

(A) Prolyl hydroxylase
(B) Lysyl oxidase
(C) Lysyl hydroxylase
(D) Glucosyl transferase

379. Molecular iron (Fe) is

(A) Stored primarily in spleen
(B) Absorbed in the intestine
(C) Absorbed in the ferric, Fe^{+++} form
(D) Stored in the body in combination with ferritin

380. All the following statements regarding calcium are correct except

(A) It diffuses as a divalent cation
(B) It freely diffuses across the endoplasmic reticulum of muscle cells
(C) It can exist in the blood as ionic form and also protein bound
(D) It is found in high concentration in bones

381. Iron is absorbed from

(A) Stomach
(B) Duodenum and jejunum
(C) Ileum
(D) Noen of the above

382. The normal route of calcium excretion is

(A) Kidney
(B) Kidney and Liver
(C) Kidney and Intestine
(D) Kidney, Intestine and Pancreas

383. Hypocalcaemia affects

(A) Skeletal muslces
(B) Smooth muscles
(C) Cardiac muscles
(D) Skeletal muscles + smooth muscles + cardiac muscles

384. Transferrin is a type of

(A) Albumin (B) α-globulin
(C) β_1 globulin (D) γ-globulin

385. In case of wilson's disease, the features include all of the following except

(A) Progressive hepatic cirrhosis
(B) Keyser Fleisher ring
(C) Aminoaciduria
(D) Urinary excretion of Cu is decreased

386. In Vitamin D poisoning (hyper-vitaminosis)

(A) Both serum and urinary "Ca"
(B) The serum Ca is low and urinary calcium high
(C) The serum "Ca" is increased and urinary "Ca" is normal
(D) Both serum and urinary "Ca" are low

387. The % of 'K' in Extracellular fluid is about

(A) 1% (B) 2 to 3%
(C) 10% (D) 15%

388. The Fe containing pigments is

(A) Haematoidin (B) Bilirubin
(C) Hemasiderin (D) Urobilinogen

389. All of the following are true of Wilson's disease except

(A) Low total plasma Cu
(B) Elevated urinary copper
(C) Arthritis
(D) Aminoaciduria

390. An increased serum 'Iron' and decreased 'Fe' binding capacity are found in

(A) Fe-deficiency anaemia
(B) Sideroblastic anaemia
(C) Thalassaemia
(D) Anaemia of chromic disorders

391. Iron therapy is ineffective in which of the following conditions:

(A) Chronic blood loss
(B) Inadequate Fe intake
(C) Hypochromic anaemia of pregnancy
(D) Thalassaemia minor

392. In hoemochromatosis, the liver is infiltrated with

(A) Copper (B) Iron
(C) Manganese (D) Chromium

393. Which of the following is true? Hypochromic anaemia is not due to iron deficiency except

(A) Serum 'Fe' is high
(B) Normal/low transferrin
(C) Stainable iron in bone marrow
(D) Iron therapy is affective

394. Cytosolic superoxide dismutase contains

(A) Zn only (B) Cu only
(C) Zn and Cu (D) Mn

395. A rise in blood 'Ca' may indicate

(A) Paget's disease (B) Vitamin D deficiency
(C) Cushing's disease (D) Hypervitaminosis D

396. The essential trace element which catalyzes the formation of Hb in the body is

(A) Mn (B) Se
(C) Mg (D) Cu

397. Zinc is a constituent of the enzyme:

(A) Succinate dehydrogenase
(B) Carbonic anhydrase
(C) Mitochondrial superoxide dismutase
(D) Aldolase

398. The active transport of 'Ca' is regulated by _____ which is synthesized in kidnyes.

(A) Cholecalciferol
(B) Ergosterol
(C) 25-OH cholecalciferol
(D) 1, 25-di OH-Cholecalciferol

399. Ceruloplasmin shows the activity

(A) As ferroxidase (B) As reductase
(C) As ligase (D) As transferase

400. The principal cation of extra cellular fluid:

(A) K^+ (B) Na^+
(C) H^+ (D) Ca^{2+}

401. What is the principal cation of intracellular fluid?

(A) K^+ (B) Na^+
(C) Ca^{2+} (D) Mg^{2+}

402. What is the normal level of K^+ in the serum ?

(A) 137–148 mEq/L (B) 120–160 mEq/L
(C) 3.9–5.0 mEq/L (D) 0.3–0.59 mEq/L

403. The general functions of minerals are

(A) The structural components of body tissues
(B) In the regulation of body fluids
(C) In acid-base balance
(D) All of these

404. What are the functions of potassium?

(A) In muscle contraction
(B) Cell membrane function
(C) Enzyme action
(D) All of these

405. The daily requirement of calcium is

(A) 200 mg (B) 400 mg
(C) 800 mg (D) 600 mg

406. The normal serum inorganic phosphorous level is

(A) 1.5–2.5 mg/100 ml
(B) 2.5–4.5 mg/100 ml
(C) 4.5–6.5 mg/100 ml
(D) 0.5–1.5 mg/100 ml

407. When phosphorous level is lowered ?

(A) In hyper thyroidism (B) Cirrosis of liver
(C) Leukemia (D) Hypothyroidism

408. Ferritin is

(A) Coenzyme
(B) One of the component of photophosphorylation
(C) It is the stored form of iron
(D) Non-protein moiety

409. What is ceruloplasmin?

(A) Plasma protein (B) Stored form of copper
(C) Both A and B (D) None of these

410. The following are the functions of copper:

(A) Constituent of cytochromes
(B) Catalase
(C) Tyrosinase
(D) All of these

411. Zn is present as prosthetic group in this enzyme:

(A) Carbonic anhydrase
(B) Carboxy peptidase
(C) Lactate dehydrogenase
(D) All of these

412. Fluorosis is caused due to

(A) Excessive intake of fluorine
(B) Low intake of fluorine
(C) Discoloration of the teeth due to low intake
(D) All of these

413. What is the state of iron in transferrin?

(A) Ferrous form (B) Ferric form
(C) Both A and B (D) None of these

414. Haemoglobin formation needs both

(A) Iron and Zinc (B) Iron and Calcium
(C) Iron and Copper (D) Iron and Magnesium

ANSWERS

1. A	2. C	3. C	4. A	5. B	6. B
7. C	8. B	9. C	10. D	11. C	12. C
13. B	14. A	15. B	16. A	17. B	18. D
19. D	20. A	21. A	22. A	23. C	24. B
25. C	26. C	27. A	28. C	29. C	30. A
31. D	32. A	33. D	34. A	35. B	36. D
37. B	38. C	39. A	40. A	41. B	42. A
43. D	44. A	45. B	46. A	47. A	48. D
49. D	50. A	51. D	52. A	53. A	54. A
55. D	56. B	57. B	58. A	59. C	60. D
61. A	62. D	63. D	64. D	65. B	66. D
67. D	68. D	69. C	70. D	71. A	72. B
73. C	74. D	75. D	76. B	77. A	78. C
79. A	80. D	81. A	82. A	83. C	84. A
85. C	86. D	87. A	88. C	89. D	90. D
91. C	92. B	93. D	94. C	95. B	96. C
97. B	98. A	99. D	100. A	101. C	102. A
103. B	104. B	105. A	106. D	107. C	108. B
109. A	110. D	111. C	112. D	113. A	114. B
115. A	116. A	117. D	118. A	119. D	120. D
121. B	122. A	123. A	124. B	125. A	126. A
127. A	128. C	129. A	130. A	131. B	132. C
133. D	134. C	135. C	136. C	137. A	138. B
139. A	140. B	141. A	142. D	143. C	144. C
145. D	146. D	147. B	148. D	149. C	150. D
151. C	152. C	153. B	154. D	155. A	156. C
157. D	158. B	159. A	160. D	161. C	162. D
163. A	164. C	165. C	166. A	167. A	168. D
169. A	170. D	171. A	172. A	173. A	174. A
175. B	176. A	177. A	178. C	179. A	180. C
181. D	182. B	183. A	184. D	185. C	186. A
187. B	188. C	189. B	190. C	191. C	192. D
193. A	194. D	195. D	196. D	197. A	198. A
199. A	200. C	201. B	202. A	203. D	204. A
205. A	206. B	207. C	208. D	209. B	210. C
211. A	212. C	213. B	214. A	215. B	216. A
217. A	218. A	219. B	220. D	221. A	222. A
223. B	224. D	225. B	226. A	227. C	228. A
229. C	230. A	231. C	232. B	233. C	234. D
235. A	236. C	237. A	238. B	239. A	240. B
241. D	242. B	243. A	244. A	245. A	246. A
247. C	248. A	249. A	250. D	251. D	252. B

253. D	254. C	255. D	256. C	257. C	258. D
259. A	260. B	261. D	262. B	263. C	264. C
265. D	266. C	267. D	268. D	269. A	270. C
271. A	272. D	273. D	274. A	275. C	276. D
277. D	278. D	279. C	280. A	281. D	282. A
283. B	284. B	285. C	286. C	287. C	288. C
289. B	290. C	291. A	292. D	293. D	294. D
295. C	296. C	297. C	298. D	299. B	300. C
301. A	302. C	303. D	304. A	305. D	306. B
307. B	308. D	309. A	310. C	311. C	312. C
313. D	314. C	315. C	316. C	317. D	318. C
319. C	320. D	321. C	322. C	323. B	324. B
325. D	326. D	327. C	328. D	329. C	330. C
331. B	332. B	333. D	334. A	335. B	336. D
337. C	338. D	339. C	340. C	341. C	342. D
343. C	344. D	345. D	346. B	347. C	348. D
349. B	350. C	351. B	352. B	353. B	354. D
355. A	356. C	357. A	358. D	359. D	360. A
361. C	362. D	363. B	364. B	365. C	366. D
367. A	368. C	369. B	370. C	371. B	372. D
373. C	374. C	375. C	376. A	377. C	378. B
379. D	380. B	381. B	382. C	383. D	384. B
385. D	386. A	387. A	388. C	389. C	390. B
391. D	392. B	393. D	394. C	395. D	396. D
397. B	398. D	399. A	400. B	401. A	402. C
403. D	404. D	405. C	406. B	407. A	408. C
409. C	410. D	411. D	412. A	413. B	414. C